5TH INTERNATIONAL CONFERENCE ON ONCOLOGY AND CANCER RESEARCH

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Mediastinal lesion characterization and prognostication using diffusion MRI: from whole lesion to target zone with dynamic approach

Keywords
MR imaging (MRI), Functional MR, Mediastinal lesions, Resectability

Main Theme
Cancer screening and diagnosis

Purpose
Invasive surgical procedures are currently the cornerstone of mediastinal staging but can lead to patient discomfort and morbidity. we attempted to use a noninvasive MRI approach to differentiate benign from malignant mediastinal lesions and at the same time attempt to provide an imaging-based preoperative evaluation of lesion resectability and to use a slider-based software for b-value appointment for prognostication of outcome.

Materials and Methods
100 consecutive patients with a suspicious mediastinal lesion on clinical or on imaging-based (CT, PET or EBUS) examinations underwent an MRI, including diffusion-weighted imaging (DWI), one day prior to surgery. All MR images were evaluated by visual inspection and by calculating the ADC values (mean) of the whole lesion and of the suspected zone on b2000 DWI. Moreover, a dynamic slider-based software was used to find the extrapolated b-value where the lesion disappears in the background noise. Histological examinations of operative specimens served as reference.

Results
In total 43 benign and 57 malignant lesions were included. Differentiating based on whole-lesion mean ADC was acceptable (sensitivity/specificity/accuracy 87%/47%/72%, optimal threshold 2.08*10-3mm2/s). On b2000 DWI were expected to only show malignant lesions. Surprisingly, using this cut-off value in the dynamic slider-based assessment of extrapolated DWI, differentiation between benign and malignant lesions showed remarkable sensitivity, specificity and accuracy of 100%, 68% and 88%. Survival analysis showed the group of cases with sliding b above 2000 s/mm2 to have a much shorter overall survival compared to those below 2000 A very high correlation was found between MR signs of local invasion and surgical resectability (Cohen's Kappa 0.88).

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Conclusions

DW-MRI offers preoperative characterization and resectability assessment of mediastinal lesions. Targeted lesion analysis and dynamic software interpretation hold promise for improved diagnostic accuracy.

Biography

Dr. Johan Coolen is a thoracic radiologist and professor clinical radiology in the faculty of Medicine at the Catholic University of Leuven. His clinical and research interests are in the areas of diffuse lung disease, lung cancer and especially in the field of imaging of the pleura, mediastinum and esophagus using MR imaging.

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